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ABSTRACT

The Advisory Panel on the Scholastic Aptitude Test (SAT) Score Decline contends that many factors have contributed to the drop in scores on the SAT and many other tests. The research evidence and theory about three social motives that could be expected to play some role in test performance and academic functioning are examined: the motives for achievement, for affiliation, and for power. The possibility of a motivational overload is also discussed. Broad cultural trends (i.e., post-Sputnik emphasis on academic achievement, revolt of the counterculture, crisis of values in Vietnam and Watergate) and related specific changes in the educational system (open, alternative, and humanistic education) may have direct and indirect effects on motives. Some hypotheses suggest that actual motive levels went up or down with corresponding effects on academic performance. Others suggest the ways in which social forces may have changed beliefs about the nature and value of academic work, beliefs that may interact with relatively constant motive levels to produce behavior changes. (Author/EVH)

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Motivational Factors in the SAT Score Decline

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INTRODUCTION

There is now unmistakable evidence that scores on the Scholastic Aptitude Test (SAT) and other tests of academic performance have declined among American secondary school students since 1963. In this paper I suggest some motivational factors that may have contributed to this decline, or at least have been involved in it. I shall not argue that motivation is the complete explanation or the only explanation, but rather that motivational factors may have played some role in the downward drift of scores. My analysis and suggestions are not based on a priori speculation, but are drawn from the accumulated evidence of more than thirty years of systematic psychological research on several important human motives. This paper assumes, of course, that the SAT score decline is at least to some extent "real," that it cannot be explained (or fully explained) in terms of artifacts such as changes in test items, changes in the composition of groups tested, less complete congruence between subjects taught in school and subjects covered in the test, or other nonmotivational factors such as the putative influence of changes in family size on intelligence (cf. Zajonc and Markus, 1975). These issues have been discussed by Harnischfeger and Wiley (1975), among others. Also outside the scope of this paper (but treated by others) is the role of values -- about education, success, the good life, etc. -- in SAT score declines.

The major premise of this paper is that performance on tests such as the SAT, like performance on the academic tasks predicted by SAT scores, is some joint function of ability and motivation. Ability is what the tests are designed to measure, and is probably related to test performance in a simple, positive, monotonic way: other things being equal, the higher the ability -- the higher the test score. The nature and effects of motivation are, however, more complicated. The general term "motivation" stands for the total combined effect of different specific motives, some of which might be positively associated with test performance (e.g., motives to achieve or excel), and some of which might be negatively associated with test performance (e.g., anxiety or distracting motives). Certain motives, such as a motive to please parents, might help or hinder test performance depending on whether the relevant "other" (e.g., parent) valued this performance. Finally, most motives probably have a nonmonotonic relationship to test performance. The variable effects of anxiety are the most familiar example: at lower levels, it can energize a lethargic student, but at higher levels it can "freeze" or inhibit performance.¹ For these reasons, it should be clear that there will be no simple answer to the two questions of how "motivation" as a whole affects test performance, and how motivational factors may be involved in the decline of SAT scores. In such circumstances it is well to proceed one step at a time, and to examine the possible separate effects of each motivational factor.

In this paper, therefore, I shall examine the research evidence and theory about three important human social motives, each of which could be expected to play some role in test performance and academic functioning: the motives for achievement, for affiliation, and for power.² Clearly it is not intended to be an exhaustive or complete review of all psychological perspectives on the issue. In the research tradition that I

shall discuss, these motives are usually measured by scoring samples of spontaneous or operant thoughts, associations, and imagination, rather than by asking people directly about their motive levels. Since the two ways of measuring motives do not yield the same results, I shall use the technical names n Achievement, n Affiliation, and n Power to designate motives measured in this operant way.

The Achievement Motive

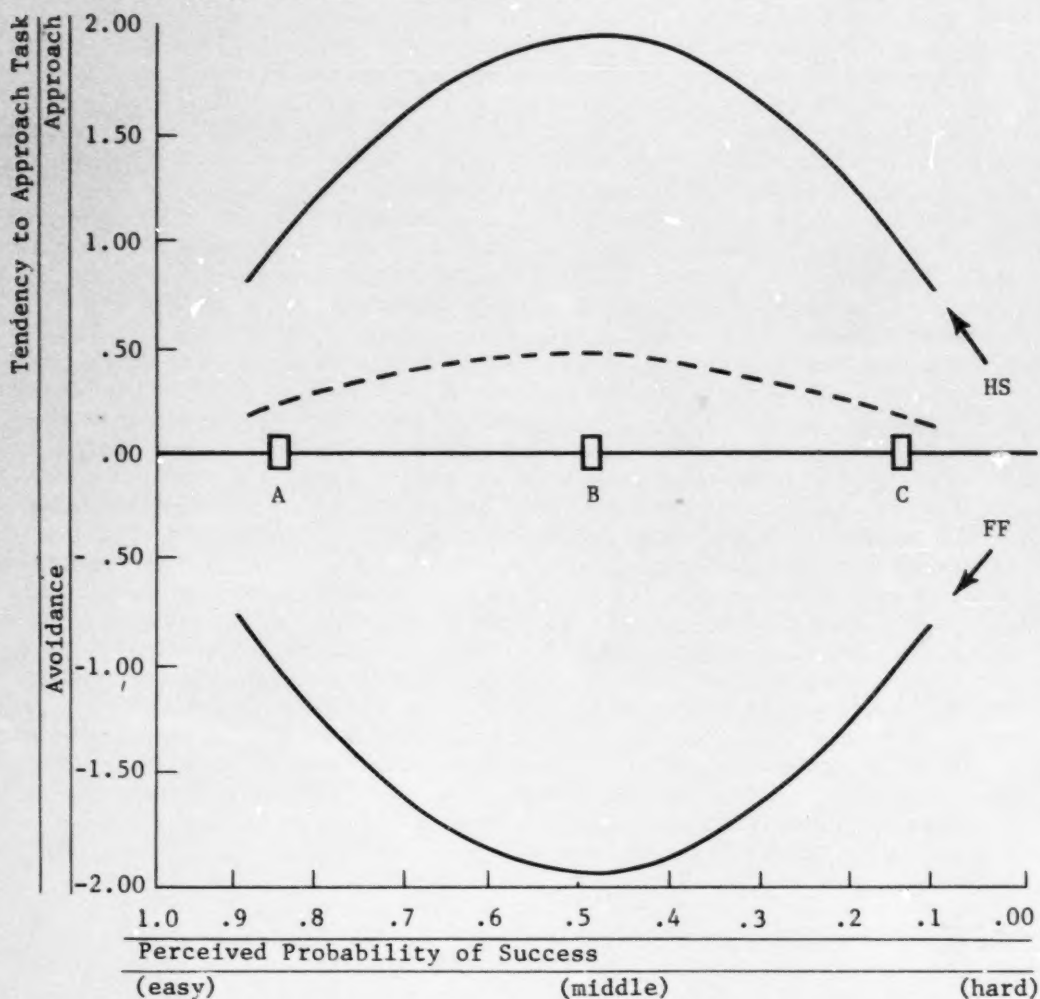
The major question of this paper can now be simply phrased: What do we know about the levels and characteristics of these three motives that might contribute to explaining the SAT-score decline? While it would seem obvious that the achievement motive (n Achievement), a concern with excellence and doing well, would be connected with academic achievement and therefore test performance, it consistently correlates much more highly with entrepreneurial or business achievement than with academic achievement. In order to explain this pattern, and to elucidate the ways in which n Achievement does influence academic and test performance, it is necessary to make a brief excursion into the theoretical model of the dynamics of action that has been worked out by Atkinson and his colleagues. The essential features of this model can be expressed in three propositions: (1) Achievement motivation involves two independent components -- an approach motive, or Hope of Success; and an avoidance motive, or Fear of Failure. The first component arouses action and leads us to choose and strive for goals that give us a feeling of excellence or having done well. The second component inhibits action and leads us to avoid choosing goals and acting in such a way that we are likely to fail. (2) Each component interacts in a multiplicative way with two further variables to produce action: the expectancy of the relevant goal (success or failure) and the value or incentive of that goal (amount of success feeling or amount of aversive failure feeling). For each component, this interaction can be represented by the following formula:

$$\text{Tendency} = \text{Function} (\text{Motive} \times \text{Expectancy} \times \text{Incentive})$$

The resultant tendency to strive for a particular goal, or to choose a particular task, would then be the sum of the two component tendencies for that task -- the one positive, (approach tendency) and the other negative, (avoidance tendency). (3) At least in the domain of achievement goals, expectancy and incentive are inversely related -- i.e., as the perceived probability of success increases from .00 to 1.00, the subjective value or "achievement satisfaction" declines from 1.00 to .00. In like manner, as the probability of failure increases from .00 to 1.00, the aversiveness of failure declines. (It is, after all, not so bad to fail at an impossible task!) These three propositions are illustrated in Figure 1, which summarizes a good deal of research on level of aspiration, choice, persistence, and actual performance as a function of perceived task difficulty.

The top curve in Figure 1 (curve HS) shows the choice and approach behavior of a person high in (net) Hope of Success (arbitrarily set at 8), while the middle dashed curve shows the behavior of a person lower

Figure 1. Tendency to Approach a Task as a Function of Perceived Difficulty and Achievement-Related Motives



in net Hope of Success (arbitrarily set at 1). For each person, task B of middle difficulty is more attractive than task A (easy) or task C (hard); but for the high HS person the differential is quite substantial, while for the low HS person it is much smaller and could readily be overridden by other, extrinsic motive considerations (conformity, pleasing others, etc.). Notice, however, that the situation is exactly reversed for the high Fear of Failure person, as represented by the bottom curve (FF). Here moderate-difficulty tasks are the most aversive ones and therefore the ones most likely to be avoided. In fact, tasks of any difficulty are below the line of theoretical indifference, which suggests that FF people find any achievement task aversive, and would only choose and strive in the achievement domain if they are forced to or if other, extrinsic motives are in operation. Once in the achievement domain, they will choose (and work hardest at) tasks that are either very easy or very hard -- tasks A or C in Figure 1.

Finally, the expectancy of success, or perceived difficulty of a task, can change -- either through direct alteration (as when a supervisor or teacher adjusts a task so that it is harder or easier) or indirectly, through our experiences of success or failure. Tasks on which we continually succeed become perceptibly easier (a leftward move in Figure 1), while tasks at which we keep failing increase in perceived difficulty (a rightward move). Whether these changes will make the task more or less attractive -- whether the curve of tendency to approach is rising or falling -- does depend on the initial task difficulty; but it also depends on which curve it is -- i.e., whether the person's pre-dominant motive component is Hope of Success or Fear of Failure. As an example, taking a very difficult task and making it easier (to a level of moderate difficulty -- e.g., C to B in Figure 1) will increase the tendency of HS-motivated people to choose it and do well at it; but it will make the task substantially less attractive to FF-motivated people. They will then be less likely to choose it than before or, having chosen it, will show a decrement in performance. To take another example, continued failure at a moderate task would make it less attractive to HS-motivated people, who would respond by lowering their aspirations to more "reasonable" levels; but the same continued failure would make the task more attractive to FF-motivated people, who would persist and even shift their aspirations upward in a way that appears counter to reason.

This model explains why HS-motivated people are likely to achieve and succeed in business: they select and strive hardest at tasks of moderate (versus extreme) difficulty, and they shift their aspirations "rationally" after success and failure. The model also suggests several ways in which the two components of achievement motivation should affect test performance and academic striving. (1) First, when students believe that a particular academic or test performance is instrumental to a long-term achievement goal (i.e., the particular task has associated with it a high perceived probability of success that it will advance the person along the path to a valued achievement goal) then that task becomes an "achievement task." It engages the two components of the achievement motive, as has been experimentally demonstrated several times by Atkinson and Raynor (1974). (2) Assuming that the two achievement-related motives have been engaged by the task, then aspirations, persistence and performance will vary with changing levels of perceived difficulty in the ways specified by the model.

This discussion suggests several different explanations for the decline in SAT scores over the last fifteen years. For the most part these explanations must stand as guides for further inquiry and the organization of what we already know, since direct evidence for any of them is lacking at this time.

1. Secular decline in Achievement (Hope of Success), assuming that academic test performance is perceived as instrumental to attaining further valued achievement goals. While many observers have detected a decline in the achievement ethic, there has been little systematic testing of comparable groups of students, over time. Winter, McClelland, and Stewart (1977) did find that Achievement levels declined sharply among freshmen men and women at an elite "Ivy" university between 1960 and 1974. A careful search of data archives of investigators who have tested high school and college students over the past 25 years would provide

further information on whether this was an isolated result or part of a secular decline in individual n Achievement. McClelland (1975, p. 344) found that n Achievement levels in American cultural documents increased continuously from the 1920s through the 1960s, which is the approximate beginning point of the SAT decline. More extensive year-by-year samples of such cultural documents (works of fiction, children's readers, hymns and popular songs, etc.) could be coded in order to pinpoint recent cultural trends in motive levels.

Apart from such overall national trends, it is also possible that n Achievement has declined among some socio-economic and ethnic groups (e.g., those whose children go to SAT-required colleges) while increasing among other groups (e.g., those who tend not to go to college, or who tend to go to colleges where the SAT is not required). Thus Veroff, Feld, and Gurin (1962) found that middle-aged, middle- and lower-income Roman Catholics with large families had extremely high levels of n Achievement when tested in a national sample survey in the mid-1950s. It may be that achievement motivation and perhaps academic performance has, as it were, "migrated" to this group and away from the traditional upper-middle class Anglo Saxon Protestant groups. This should be considered together with Horner's argument that college continues to be for some groups a means to social mobility but not so for other groups for which it was so in the past.

2. Secular increase in Fear of Failure. While Hope of Success and Fear of Failure are two independent components of the achievement motive, any increase in Fear of Failure should, other things being equal, have effects on academic choice and performance that are similar to the effects of declining Hope of Success. In Figure 1, either such change would be a shift from the HS line to the FF line. Tasks that used to be readily approached and persistently worked on (middle-range tasks) would now be most strongly avoided. In addition, the whole domain of achievement behavior would become to some extent aversive. In the research tradition that is the focus of this paper, Fear of Failure is often measured by questions such as the following, which reflect debilitating anxiety: "Nervousness while taking an exam or test hinders me from doing well." and "The more important the examination, the less well I seem to do." Systematic evidence has yet to be assembled as to whether students agree with items of this sort more today than they did twenty years ago. Nevertheless, it is reasonable to suppose that they do because of increasing pressure for every kind of accomplishment and success in our culture.

Personal, social, and economic stakes are higher in the academic arena today. Increasingly, one's ultimate position (job, status) is based on one's performance, rather than on one's ascribed characteristics such as race, sex, or social class. In a meritocracy of this sort, performance standards are continually increasing. Increasing levels of anxiety are, on this hypothesis, a natural result of the higher standards and heightened competition (especially in a constrained economy).

3. Decline in the belief that academic and test performance is instrumental in attaining further valued achievement goals. Such a change in students' beliefs would have the effect of disengaging their achievement motives from academic performance, and reengaging them in whatever other actions were perceived as relevant to long term achievement goals. With this motivational support withdrawn, performance would tend to decline.

Archives of public opinion polls among high school and college students could be examined in order to test this explanation. The further corollary, that the correlation between n Achievement and high school academic performance should have decreased significantly over the years of the SAT score decline, could perhaps be tested by drawing together findings from particular studies that assessed both motive and performance in different, specific, years during this time period. Meanwhile, anecdotal and observational support for this explanation can be drawn from the assertions of Bird (1975) and numerous others who have questioned the relevance of academic performance to any number of later vocational and other achievement goals. The current debate about the relative merits of a liberal arts education and training of "salable skills" is pertinent here.

4. Changes in secondary schools that, interacting with HS and FF, decrease the approach tendency toward academic tasks. This complex of explanations follows from the model in Figure 1. Several possibilities suggest themselves. For example, we know from past research that shifts toward homogeneous ability grouping in secondary schools should increase academic effort among HS motivated students but decrease it among FF motivated students (see O'Connor, Atkinson, and Horner, 1966). If academic tests and tasks used to be perceived as very difficult, then any secular trend toward making school easier would increase performance among HS students but decrease it among FF students. On the other hand, if school were perceived as only moderately difficult before the SAT score decline, then making things easier should have the opposite effects. (The same explanation applies, mutatis mutandis, to increasing school difficulty.) One might be tempted to discard this explanation, since the presumed opposite effects for HS and FF students ought to cancel each other out. However, secular changes in both school difficulty and relative predominance of HS or FF could produce an overall decline in performance. Birney, Burdick, and Teevan (1969) found that themes of "Hostile Press" (a variable conceptually and empirically related to Fear of Failure) predicted grades among junior high school, high school, and college students. If these results are generally true, then one is led to a most surprising conclusion. Educational changes that made tests and academic tasks "moderately difficult" instead of "very difficult" -- changes that seem reasonable, progressive and humane -- would have the paradoxical effect of making tests and school less attractive, unless further steps were taken to engage HS.³

5. Increase in Fear of Success. The two components of achievement motivation that have so far been discussed -- Hope of Success and Fear of Failure -- are "rational" in that they are congruent with traditional cultural values about the achievement domain. Recently, however, Horner (1974a, 1974b) has identified another component labelled Fear of Success, which seems to run counter to our cultural prescriptions. Horner argues that for some people, achievement and success are punished -- most notably through withdrawal of love, affiliation, and peer approval. Success for such persons may thereby acquire a negative valence or incentive value -- it becomes something to be avoided. Once developed, Fear of Success tends to lower performance levels in competitive achievement situations. Women and minority group members are the traditional and most striking examples of Fear of Success inhibiting performance. However, in recent years there is at least some evidence that Fear of Success has

increased among white middle-class males also.⁴ Perhaps this is a psychological manifestation of the more general "counter-culture" revolt against what is viewed as the "excessive" or "inhumane" achievement and success emphasis of traditional American culture. For whatever reasons success might have become something to fear, increased Fear of Success (as measured in more formal and operational terms) would lower performance precisely in the kind of competitive testing situation of the SAT as well as in a variety of other academic situations.

The Affiliation Motive

People who score high in n Affiliation seek warm, friendly, and cooperative relationships with others, although they can be suspicious and defensive if they think others are rejecting them. N Affiliation can sometimes act as a powerful stimulus to academic striving, as in the case of the student who does well in order to please the teacher or parents. There is some research evidence that in a classroom environment rich in affiliative cues and incentives, n Affiliation predicts performance (McKeachie, 1961). On the other hand, in such cases n Affiliation is always being deflected from its primary goal of friendly interaction. Over time, it would be difficult to keep the motive on the "academic" track with alternative behaviors that are more efficient in attaining the goal readily available. Thus while the affiliation motive may produce good social relationships and a cooperative, friendly attitude in the classroom, it is a motive that is extrinsic to academic performance as such. Under some circumstances it could be engaged to support academic performance, but this support is not likely to be sustained if alternative sources of affiliation are readily available.

6. Increases in N Affiliation. In the late 1960s love and intimacy emerged as strong themes in American popular culture. It is surely plausible to argue that the increased prominence of these themes is one manifestation of a general increase in n Affiliation, while decreased emphasis on school achievement and lower test scores is simply another sign of the same trend. On the other hand, there is little direct evidence of higher n Affiliation levels. Winter, McClelland, and Stewart (1977) found no shifts, and McClelland (1975, p. 338) actually found that n Affiliation coded from cultural documents decreased from the 1950s to the 1960s.

7. Educational policy changes that have increased the role of n Affiliation. Even though average levels changed, the affiliation motive could have an indirect effect on academic and test performance in conjunction with changes in educational policy and practice. Many of the educational reforms of the past fifteen years, for example, emphasized the role of affiliation in the academic process. General concern for students' social adjustment increased, and specific steps were taken to decrease the distance between teacher and student, and to reduce hierarchy in the classroom. In motivational terms, the effect of these changes would be to engage n Affiliation, to have this motive carry more of the load of supporting academic behavior. Given the premise that schools need all the motivational help they can get, such a broadened motive base for academic effort seems to be a wise step. On the other hand, trying to engage n Affiliation in the classroom does involve some risk. The world of the

adolescent is full of other incentives and "outlets" for affiliation; most of them are available with less effort and greater certainty than is school. Put another way: in emphasizing affiliative rewards, a school may be trying to broaden its appeal, but it is then competing in a league where it is at a relative disadvantage (unless it renounces achievement standards completely and becomes just another "peer group institution"). Thus, the increased school emphasis upon affiliation incentives might, then, have the paradoxical effect of distracting students -- of driving them to seek these incentives outside of the school. In any case, to the extent that a school reduces achievement incentives in favor of other goals (in either relative or absolute terms), it is sacrificing one of its most potent and specific incentive systems.

The Power Motive

People who score high in n Power are concerned with having impact on others and gaining prestige in the eyes of the world. They seek and get formal social power, but they affect other people in a variety of less formal and less socialized ways, such as by taking extreme risks and engaging in profligate drinking and sexual behavior. While under certain circumstances, when the classroom environment is rich in power cues, the power motive may facilitate performance (see McKeachie, 1961), in general n Power does not seem to be a motive that readily supports academic performance. Learning and test performance are in some sense individual activities and the adolescent world is simply too full of readily available, more attractive, power incentives.

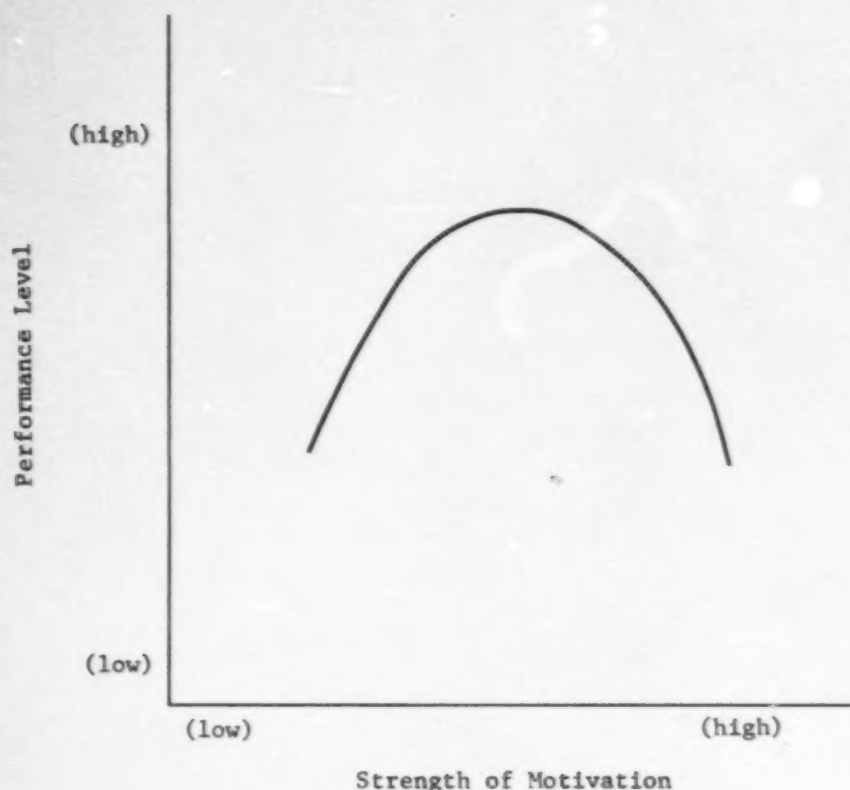
8. Increases in N Power. An obvious motivational hypothesis to explain the decline in SAT scores is, therefore, an increase in levels of the power motive among students. Certainly "power" was a central concern of the 1960s and 1970s: the emphasis upon "vigor" in the Kennedy years; the struggle for and against political power on issues such as Vietnam, civil rights, and other allied "movements"; the prominence of powerful multinational corporations; the increased emphasis upon violence in the media, sports, and fiction (For example, the James Bond series); and finally, the renewed interest in the occult as a source of secret and esoteric power. In line with these aspects of American cultural life, McClelland found a sharp increase in n Power levels in cultural documents from the 1950s to the 1960s. Winter, McClelland, and Stewart (1977) found that while total power motive scores did not increase significantly from 1960 to 1974, Fear of Power (the avoidance component of the motive) did increase. The overall picture is far from clear, and more evidence needs to be gathered on this point. Meanwhile, it is plausible to argue that increased concerns with power, impact, and prestige at all levels of society have drawn concern, energy and effort away from academic and test performance. Power is, then, another distraction from the academic situation.

Motivational Overload?

A final motivational hypothesis derives not from the study of any par-

ticular motive, but rather from the total sum of all motivational influences.⁵ One of the oldest and best well established principles of psychology is expressed in the Yerkes-Dodson law: that as levels of motivation (or arousal) increase, efficiency and effectiveness of performances first increase but then drop. Performance is optimal at some middle level of motivation (the exact point, of course, depending on the nature of the task and on individual differences). This relationship is shown in Figure 2.

Figure 2. Relation of Motivation Level to Performance: The Yerkes Dodson Law



How might such a principle explain the decline in scores? First, let us assume that academic performance is ordinarily based on the achievement motive. The increased emphasis on the instrumental importance of education (and test scores) over the past two decades has, arguably, increased achievement motive arousal in academic settings. At the same time, moreover, educational changes have engaged other motives (e.g., affiliation and power) to support academic performance. As a result, the total sum of motivation directed toward academic and test performance is greatly increased. (In Figure 2, this is represented by a move to the right along the curve.) The effect on performance of such an increase in total motivation will vary from student to student, depending on individual differences in motive levels and other variables. As the total level of moti-

vation increases, however, performance will begin to decline in more and more students, "over motivation" being the cause.

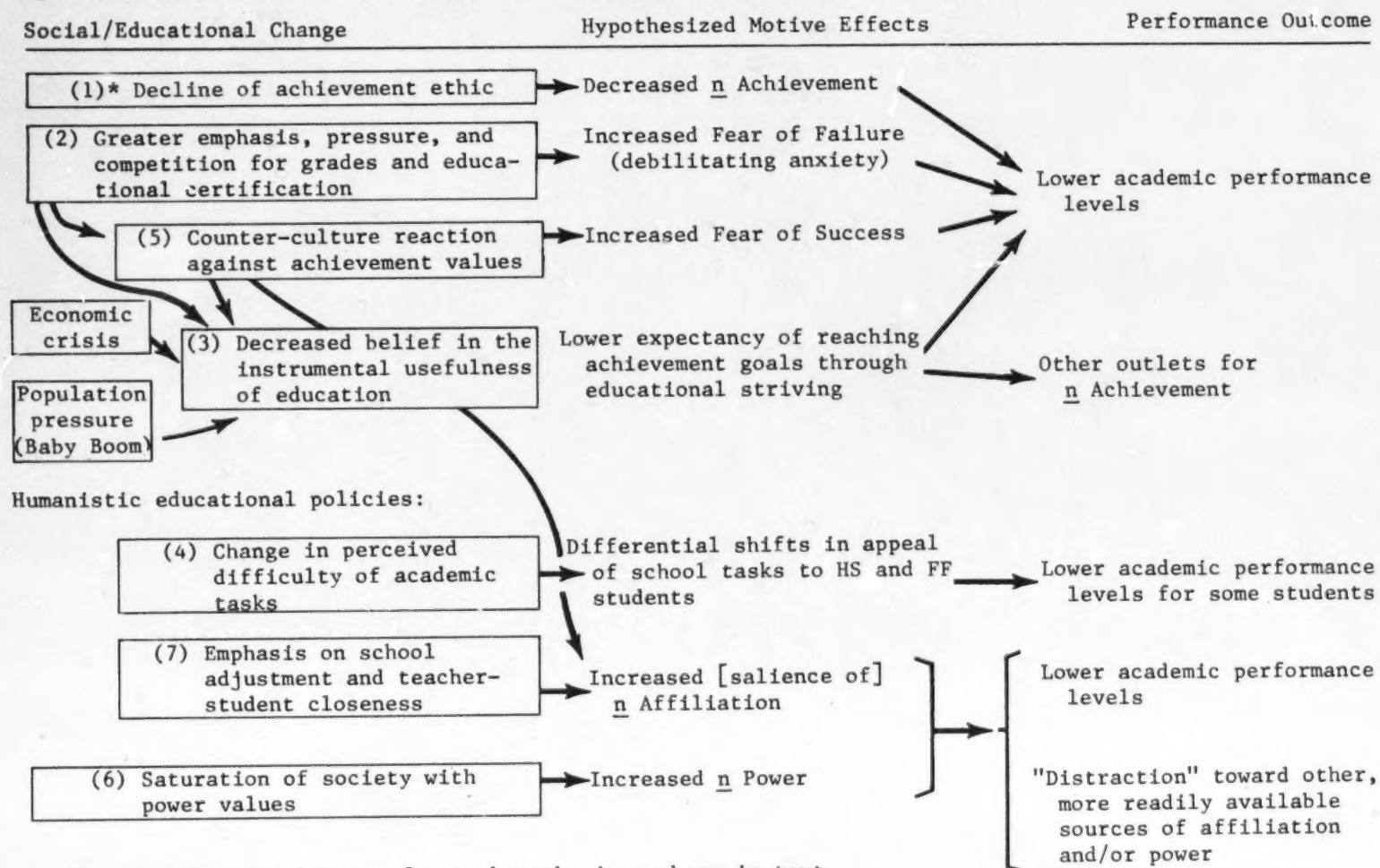
This hypothesis suggests that what has declined is performance on a standardized test, and not ability as such or even academic achievement overall, since cumulative academic achievement depends upon amount of time spent in academic work as well as on efficiency level while at work. Time spent in an activity should be a direct and not curvilinear function of motivation levels for that activity.⁶ While such a prediction from the hypothesis is clear, it is also difficult to evaluate because of our uncertainty about trends in cumulative academic achievement. To be sure, average grades have increased, but many educators would argue that this is because of "grade inflation" rather than improved performance. Yet the best measures of performance -- the most comparable across time and the least subject to inflation -- are the standardized tests, for which students are hypothetically overmotivated.

The Uses of a Motivational Analysis

This paper has suggested certain ways in which particular human social motives may have played a role in the recent decline of SAT scores. Several cultural trends have emerged in American society over the past fifteen years: emphasis on academic achievement in the "post-Sputnik" era, the revolt of the counterculture, the entry of the "Baby Boom" children into the work force, and the crisis of values in Vietnam and Watergate. Related to these broader trends, certain specific changes appeared in the educational system: school as a focus or crucible for broader social, cultural, and political views and conflicts; trends toward "open," "alternative," and "humanistic" education; questioning of traditional subjects and methods of instruction. These broader social forces, in turn, have direct and indirect effects on the levels and functioning of particular human social motives such as the various components of achievement motivation, and the affiliation and power motives. Some of the hypotheses outlined above suggest that actual motive levels went up or down with corresponding effects on academic performance. Other hypotheses focus on the ways in which broad social forces may have changed beliefs or expectancies about the nature and instrumental value of academic work; these changes affect academic performance by interacting with more stable motive levels. Social trends and educational changes "cause" changes in behavior not by themselves, but rather in combination and interaction with individual persons. Motives are, in this view, one important medium through which social events and trends are transmitted down to the level of changed behavior of individuals and aggregates of individuals. Figure 3 charts the analysis and shows how certain hypothesized motive changes and motive-related effects can be derived from the broader social forces. In some cases, the social forces themselves interact, as shown in the figure.

Some of the suggested hypotheses overlap, while others are mutually contradictory. Further evidence will be needed in order to decide among the hypotheses. One important source of relevant data is the numerous studies carried out by a variety of investigators over the past 20 years in which adolescents were given SATs or similar tests. We have used data

Figure 3. Relations of Social Change, Individual Motives, and Academic Performance



*Numbers in parentheses refer to hypothesis numbers in text.

from one such study in this way (Winter, McClelland, and Stewart, 1977), noting changes in motive levels of college freshmen over fourteen years. This study is quite fragmentary -- for only one picture was used in both tests, and the subjects were highly selected. By systematically noting the year of testing, age of sample, and average motive level, it would be possible to document and track secular changes in motive levels that would support particular hypotheses and rule out others. (It would be necessary, of course, to take into account and track separately each separate picture or verbal stimulus in order to insure comparability.) Moreover, where investigators had gathered information about school grades and academic test performance, this information could also be noted in order to plot systematically any changes in the pattern of relationships among motive score, ability, and performance.

Another important source of relevant data will be the forthcoming research designed to replicate the 1950s study in which the Thematic Apperception Test was administered to a national sample survey (Veroff, Atkinson, Feld, and Gurin, 1960; see also the Veroff, Feld, and Gurin, 1962, study cited above). When completed, this research will pinpoint which motives changed in which population subgroups during the 20 year interval between the 1950s and the 1970s (Joseph Veroff, personal communication).

Finally, once data of this sort have been collected, it would also be possible to analyze the broad question of motivational elements in the SAT score decline into four more differentiated and specific problems: (1) Changes in the motives of students relevant to taking the SAT test itself; (2) Changes in the motives of students relevant to activities preparatory and instrumental to the SAT-test (taking hard courses, studying hard, etc.); (3) Changes in the motives of teachers and school administrators relevant to the way in which they do their jobs; and (4) Changes in motives in the public constituencies that elect school boards, vote taxes, and to whom the whole educational system is, in the end, accountable.

The major purpose of this paper has been to suggest ways in which theory and research on human motivation and specific human motives can broaden the explanation of the SAT score decline phenomenon, and to suggest how further data to support these explanations can be gathered from existing research files scattered among several investigators across the country. Once established and documented, a motivational explanation could also be of use in order to arrest and reverse the decline. There now exists a considerable body of tested theory, practice, and educational "technology" about changing motives (especially in adolescent school populations) and changing classroom climate in order to enhance motivated performance (McClelland and Winter, 1969; Kolb, 1965; Alschuler, Tabor, and McIntyre, 1970; McClelland and Alschuler, 1971; deCharms, 1976). Drawing upon these projects, it should be possible to design an educational environment in which students' motives function more effectively -- to their fullest potential in both test performance and long term academic achievement.

Notes

1. This phenomenon, known technically as the Yerkes-Dodson law, will be discussed below under the heading of "motivational overload."
2. For further information about the nature and measurement of these motives, see: Atkinson (1958); Atkinson and Feather (1966); Atkinson and Raynor (1974); McClelland (1961); McClelland (1975); McClelland and Steele (1972); Winter (1973); Winter and Stewart (in press).
3. See Alschuler, Tabor and McIntyre (1970) and McClelland and Alschuler (1971) for a discussion of educational changes that engage HS.
4. Personal communication from Professor Lois W. Hoffman, University of Michigan.
5. Personal communication from Professor John W. Atkinson, University of Michigan.
6. J. R. Sawusch, in Atkinson and Raynor (1974 pp. 425-438).

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